November-December 1951

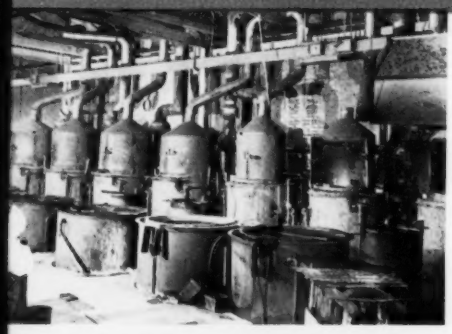
METAL TREATING

MTI
MASTER CRAFTSMEN
METAL TREATING INSTITUTE

JOURNAL OF THE METAL TREATING INSTITUTE

National Trade Association of

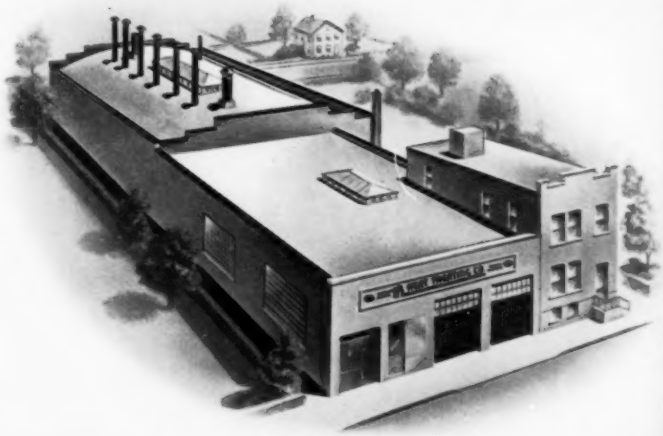
COMMERCIAL HEAT TREATERS



L-R SHOP VIEWS

← *Salt pot furnaces for cyanide hardening, liquid carburizing, neutral hardening, tool steel hardening, reheat and pack carburizing.*

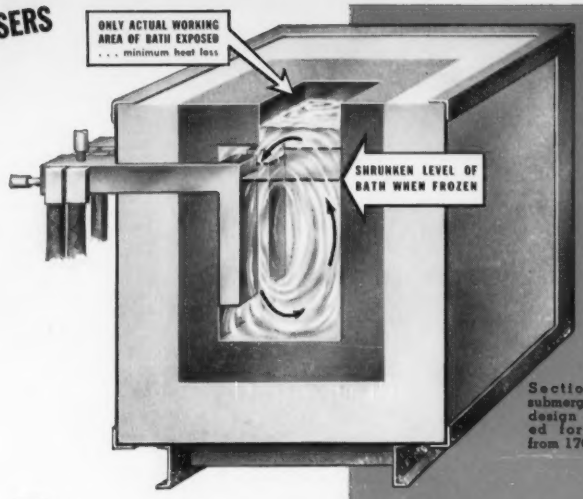
← *Three Ipsen atmosphere furnaces for controlled gas carburizing, carbonitriding, heat treating, martempering, silver brazing, stainless steel hardening, spring hardening, annealing, normalizing.*



Another example of MTI member leadership in the commercial heat treating field is this new, completely modern plant of the I. R Heat Treating Co., Newark, N. J.

A FEW WELL KNOWN AJAX USERS

A. C. Spark Plug Division
Brown & Sharpe Mfg. Company
Commercial Steel Treating Company
Henry Disston & Sons Company
Ford Motor Company
Frigidaire Division
General Electric Company
Gorham Tool Company
Greenfield Tap & Die Company
Landis Machine Company
Midvale Company
Morse Twist Drill Company
Mueller Brass Company
National Cash Register Company
National Screw Company
Oliver Iron & Steel Company
Pratt & Whitney Division
Republic Steel Company
Stanley Works
Thompson Products Company
Threadwell Tap & Die Company
Union Twist Drill Company
Wesley Steel Treating Company
Westinghouse Electric Company
. . . and dozens of others



Sectional view of submerged electrode design recommended for operations from 1700° to 2400°F.

THE Preferred Practice FOR HARDENING TOOLS AND DIES

(High Speed, High Carbon-High Chromium, Stainless and Carbon Steels)

When such an imposing array of the world's leading makers of high speed tools and dies adopt the same heat treating method and equipment, you can count on it that there's a reason—several reasons in fact.

Productive capacity is two or three times that of other heat treating methods because of faster heating.

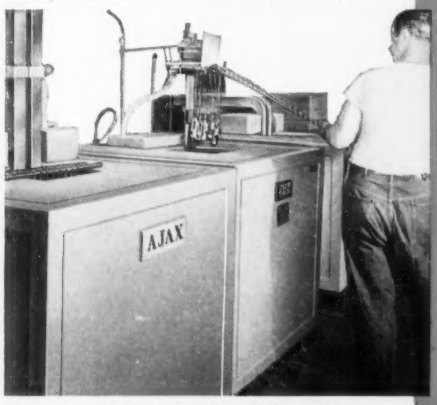
Distortion is negligible.

Surface protection is unsurpassed—because the salt bath seals the work *automatically* from all atmosphere. Scaling, decarb and pitting are avoided.

Temperature control is closer, more accurate. The temperature will not vary more than 5°F. *in any part of the bath.*

The life of tools is increased from 25% to 300% over those heated by ordinary methods.

Adaptability—The Ajax Salt Bath handles any type of high speed, carbon or alloy tool and die steel. Moreover, it occupies less floor space, does not require a skilled operator and provides maximum protection and long life for pots.



Typical installation for hardening high speed tools. Preheat, high heat and quench furnaces. The center unit operating at 2350°F. is equipped with submerged electrodes (see illustration at upper right). Preheat and quench units have suspended electrodes.

Through this unique and patented Ajax submerged electrode design, the efficiency of salt bath hardening is increased in the following ways:

Power Consumption Decreased as Much as 30%—Only the *actual working area* of bath exposed.

Electrode Life Greatly Extended—Electrodes not exposed to severe oxidizing action at surface of bath.

Bath Rectification Simplified—Oxides and dross materially reduced due to restricted bath surface.

Restarting is Easy—Closely-spaced electrodes melt salt from top downward. No danger of sealed-in pressure. No damage to pot or electrodes.

Accurate Temperature Control—Electrodynamic circulation assures temperature uniformity within 5°F. throughout bath.

Overheating of Work Eliminated—Electrodes closely-spaced, set against back wall of furnace, prevent heating current from entering work. Entire bath depth available for work.

Salt Leaks Prevented—Complete outer steel casing.

Easier Charging and Discharging—Furnace top is unobstructed.

Write for Ajax Bulletin 123

AJAX ELECTRIC COMPANY, INC.
940 Frankford Ave., Philadelphia 23, Pa.

THE WORLD'S LARGEST MANUFACTURER OF ELECTRIC HEAT TREATING FURNACES EXCLUSIVELY

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AJAX HULTGREN ELECTRIC SALT BATH FURNACES

Editorial...

BE CAREFUL WITH YOUR INFORMATION

In nearly every heat treating plant today, whether it be a commercial jobbing shop or a manufacturer's departmental operation, work is being processed which is vital to our country's re-armament program. The importance of this work is spotlighted by the recognized fact that were these processes, plants or departments suddenly eliminated, the entire program would grind to a crashing halt.

This means that both management and labor in a heat treating plant are knowingly or perhaps unknowingly in possession of much vital and technical information.

There are, sadly, many "men of ill-will" in the country today who would like to and are capable of gathering together bit by bit and piece by piece facts about our activities which can be grouped and organized. When the final picture is developed it becomes a weapon to be used against us.

It should be remembered that in the days following Hitler's attack upon Russia, the outright Communists, the "leftists," the "pinkos," the "fellow-travelers" were on our side, whooping it up and really working and producing so that we should win.

Today this is no longer so, and while many have gone underground or become suddenly silent, they are still *with* us but now *against* us. Remember, too, that they may be groups and organizations as well as individuals. In view of these facts, it behooves every one connected with the skills and methods and daily applications of metal treating processes to be careful with their information.

Know to whom you speak or write and evaluate the possibilities when asked for details of your functions or operations.

At the beginning of this year the Department of Commerce announced the availability of a service to help the public guard against the harmful release of technical information. Known as the Office of Technical Services, it will answer requests for advice as to whether certain facts, figures, or data should be disclosed. The entire process is *voluntary;* you may heed the advice you get or not as you see fit. So when approached for facts no matter under what guise, if you have any doubts—check. You may do your industry and your country a service.

In spite of the serious note, we want to repeat the time-worn but sincere wish for peace and happiness for all.

Merry Christmas and A Happy New Year

METAL TREATING

Official Journal of the Metal Treating Institute

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A Program That Fights Inflation and Offers Tax Relief*

MTI Members Hear NAM Tax Expert

In nine minutes of this program your Federal government has spent $846,000 at a rate of $5,650,000 every hour. That rate will soon rise to $8,400,000 every hour of the year. (Fig. 1)

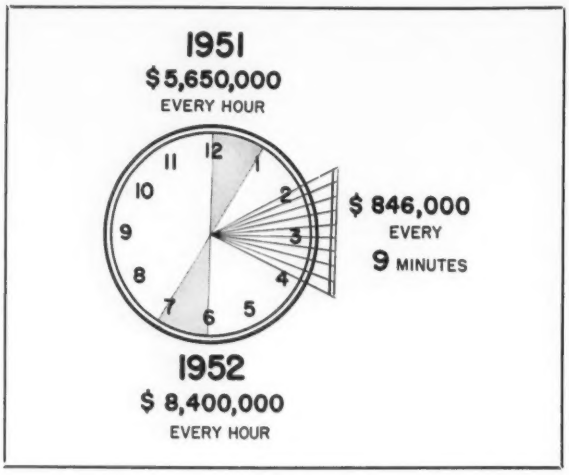


Fig. 1

We are all aware of the problem of fighting communism, but this rate of spending points up a much more insidious problem to be faced and that is the problem of inflation. The problem is hard because many people think that inflation, to a certain extent, is good. Many people say that they never had it so good, making the problem a hard one to fight. We can fight it and the first step is to cut Federal spending.

The NAM has a group whose purpose it is to study the situation. It is called the Government Spending Committee. After study, this committee feels that at least $4,400,000,000 can be cut from the Federal budget for civilian needs without hurting any service.

For example:

The armed forces employ one civilian for every two men in uniform.

The Indian Welfare Department has one civilian employe for every 30 Indians in the United States.

A proposed bill would irrigate 226,000 acres of land in Arizona owned by 402 families. This Federal outlay would be equivalent to a $550,000 gift for each family. To meet this cost, people in Boston alone would have to pay about $70,000,000 in Federal taxes. Other cities and states would pay comparable amounts. (Fig. 2)

Other useless and needless projects are now going on the costs of which are coming out of the pockets of you and me.

The first step in a tax program is to cut Federal expenses, and none of us can do too much to help accomplish that. The second is to achieve sound debt management (including a long-term transition from a controlled to a free money market). Third we must have a sound tax policy.

The tax program I am to explain is the policy of the National Association of Manufacturers. The policy has been established through the thinking of many representatives of a large number of companies, large and small, as well as tax experts and representatives of many other groups. Finally, the program was approved by the NAM Board of Directors. Companies represented by 14% of the taxation committee have less than 50 employes; 48% less than 500 employes.

What is the NAM tax policy?

First, cut Federal spending to the bone.

Second, adopt pay as we go taxation. This would have a great effect on preventing inflation. If the people were charged and had to pay every year for every bit of government they got, the administration would find that the people don't want all the government they are forced to take.

I think it is possible to show that we really can pay as we go. The loss to people in time of mobilization or war is not in dollars taken away in taxes, but in goods diverted to government use. We live and fight out of current product. Pay as you go means the diversion of private income equal to the government's diversion of product.

As an example, a company normally turns out 100 units of production. During a mobilization period the government diverts 20%, leaving 80 units of production for civilian use. The workers are going to have just as much money to spend, but for less goods, so they build up the prices of the remaining goods. But if we tax away from the people enough to pay for the lost 20 units of civilian production, there will still be enough

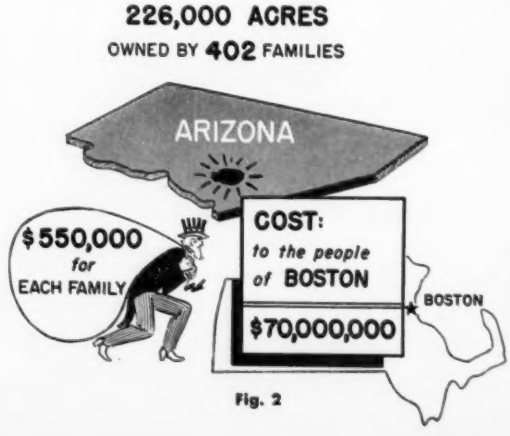


Fig. 2

*Abstracted from an address given by Mr. Charles Sligh before the annual MTI meeting in Detroit, Oct. 12, 1951. Mr. Sligh is chairman of the Taxation Committee of the National Association of Manufacturers.

money to buy the remaining 80 units. No one is hurt, and we have operated on a pay as we go basis.

Many people argue for price controls, but price controls only arrest the progress of inflation. Inflation is not high prices; high prices are the result of inflation —an excess of dollars chasing a scarcity of goods.

Actually, we always pay as we go anyway. We pay either through taxes plus inflation, or through taxes alone. Inflation alone in the cost of World War II was billed to us, as taxpayers, at 178 billion.

The NAM tax plan covers a period of defense and partial mobilization and is not necessarily one for all-out war. The first step in carrying forward the tax program is to correct the present unbalance in our tax structure by an increase in consumption taxes.

Today only 53% of the adjusted gross national income is subject to income tax, so if we are to reach a broader base, some other type of tax is needed. Broad consumption taxes can prevent the need for an excessive rate for any particular tax. Such a tax would aid in controlling inflation. Excise, or consumption, taxes are reliable sources of revenue.

We feel that people would like to receive their entire incomes and then decide themselves how that income is to be spent. That should help the country's savings, leave an incentive to earn more, permit a choice as to how the income shall be spent, and determine how much tax would be paid through the workings of a broad consumption tax.

We think a manufacturers' uniform excise tax would be best. The present excise tax system is discriminatory, taking 21 groups of items, some necessities and some not. These would be wiped out. The revenues would be replaced by a uniform 5% tax on all end products of manufacture (Fig. 3). A tire would be taxed as it went to the retailer, but not when it went to an automobile manufacturer. The later tire would finally be taxed in the price of the car, as would all other components.

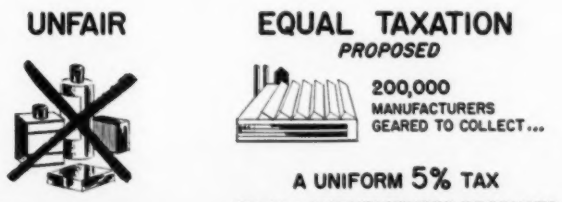


Fig. 3

Liquor and tobacco would retain their present high rate of tax. Food, personal services and rents (covering about 53% of cost of living items) would not be taxed during normal periods, thus favoring the moderate and low income groups to that extent.

That would be the peacetime tax. More money will be needed to run the government during a defense period, so a defense excise tax could be imposed and be so labelled, so as to be recognizable and more easily removed. The combined rates would be charged, during a defense period, on services such as admissions, telephone and telegraph, transportation and other services, which now pay excise taxes, but which would not normally be taxed under the proposed plan.

About $14 billion could be realized through a tax of this kind.

Thus, if we cut our civilian budget as it should be cut and installed this program it would not have been necessary to increase individual and corporate income taxes recently.

We favor a levy at the manufacturer's level rather than at retail for two reasons. First, there are about 200,000 manufacturers, other than makers of food, who would become collectors of Federal excise taxes. Most are geared to do the necessary record keeping. There are over 3 million retail outlets which would have to collect taxes if the retail levy were used. This could result in many problems, not the least of which would be the bureaucracy necessary to enforce collection of the taxes from the retailers.

Second, 29 states have retail sales taxes now, upon which they depend for about 40% of their total state revenues. The political wrath stirred up by superimposing a Federal tax on state taxes makes the alternative an impossibility, practically.

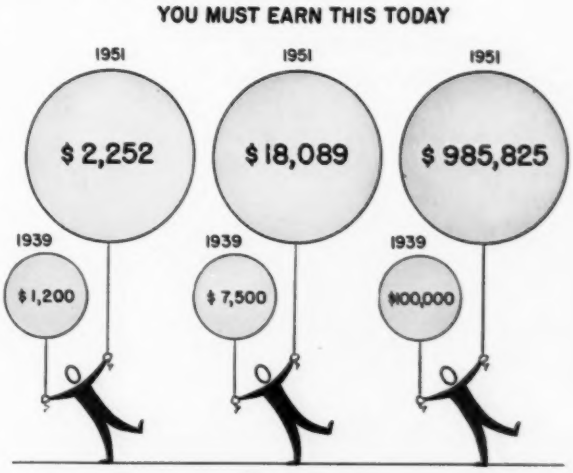


Fig. 4

Now for the individual income tax. These taxes have been raised twice since Korea. If the government confiscated all the untaxed taxable income of individuals earning $6,000 a year or more, it would only raise $6½ billion—enough to run the country for 6 weeks at present spending rates. Higher bracket incomes can't stand much more taxation.

The man that had $1,200 income in 1939 needs $2,252 this year to maintain his standard of living; one who earned $7,500 now requires $18,089 and if he earned $100,000 he now needs $985,825 merely to keep abreast of increased taxes and living costs. (Fig. 4)

(Continued on page 5)

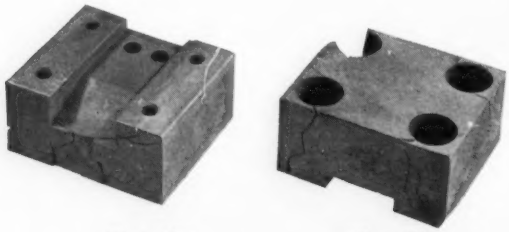
Some Common Causes of Tool Failure*

Leading steel companies are giving an increasing amount of attention to the perils which their product must encounter from the time it leaves their mill until it actually gets into working service. This is particularly true for tool steels because of their relatively high cost per pound, the very severe service conditions which they must withstand, and the high degree of skill which often must go into their design, preparation in the shop, and final heat treatment.

The Carpenter Steel Company, Reading, Pa., through its metallurgical staff, has made a continuous study of the numerous problems involved in getting tool steels to give the best possible performance. Their "Service Bulletin", published for the information of tool steel users, gives many valuable suggestions.

In looking over a recent issue, devoted to common types of failure occurring in tool steels and their causes and remedies, we were struck by a significant feature. Out of six typical illustrations of tool failures, only one was attributable to an error in heat treatment. The others were due to causes over which the heat treater had no control. Of these, some were due to purchasing the wrong size of bar stock, others were caused by faulty design, and still others to unwise practice in the machine shop or tool room. Still another common cause of trouble, selection of the wrong type of steel for a given job, was not mentioned, although Carpenter, as well as other leading tool steel companies, gladly advise their customers on this point.

The following are some examples of common and frequent causes of tool failure.



View "A" View "B"

Fig. 1

Design

A combination bending and notching die made from a straight carbon, water-hardening tool steel (Fig. 1). View "A" shows the operating side of the die, where the position of the holes is not too critical, although not ideal for a water-hardening steel. But on the other side, View "B," the designer has plainly invited disaster in hardening due to the too thin wall sections between the large holes and the outer surface. In spite of the best skill and care of the heat treater, it would be very difficult, if not impossible, to harden this piece without cracking.

Fig. 2

Bar Stock Size

Investigation of this failure (Fig. 2) clearly showed that no bark was removed from the large diameter. This is a well known cause for cracking, especially in tool steels. The purchase of a bar slightly larger in diameter and the machining off of a sixteenth or eighth of an inch cut to remove surface decarburization, surface seams, and the like which might be present would have resulted in ultimate economies.

Fig. 3

Machining

Here is double trouble, (Fig. 3). Insufficient removal of bark in machining, plus the application of a steel stencil mark. A high carbon, high chromium, oil hardening tool steel, which cracked in hardening for the reason obvious in the illustration.

*Prepared from material provided by G. E. Brumbach, Metallurgist, Carpenter Steel Co.

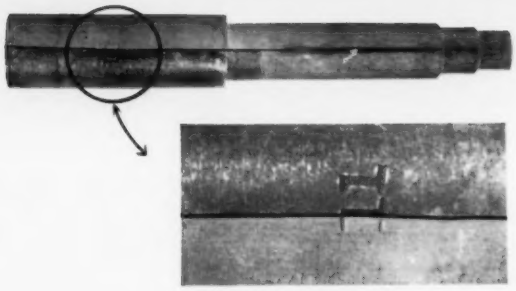


Fig. 4

A water-hardening tool steel (Fig.4) which cracked immediately upon quenching for the same reasons illustrated in Fig. 3 above, namely, insufficient removal of surface bark and the evil effect of heavy steel stencil marks.

Fig. 5

Fatigue

A typical so-called fatigue break in a pneumatic tool (Fig. 5) subject to repeated stresses. The fracture shows the well-known clam shell marking resulting from progressive failure beginning at a sharp reentrant angle resulting from tool marks, undercutting, or insufficient filleting. Any noticeable line or indentation serves as a nucleus for fatigue failure on shop tools.

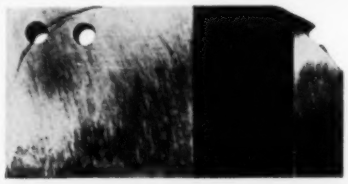


Fig. 6

Heat Treatment

A die made from manganese oil hardening tool steel with holes somewhat too near the outer surface (Fig. 6). Investigation showed that there was no good reason for even using two holes in the left corner, and that their position on either side of the die could have been changed without difficulty. However, investigation also showed that this die failed because it was only flash heated. The heat treater takes the blame for this one.

The experience of the metallurgist and heat treater, learned the hard way, should be made available to, and accepted by, the designer, the purchasing agent, and the tool maker, so that a minimum of wasted time, money, and lost production will result in the final critical hardening stage.

A Program That Fights Inflation and Offers Tax Relief

(Continued from page 3)

A man with $9,000 income today pays twenty times the tax of a $3,000 income man, and so on up the scale.

There is a way to raise individual income taxes fairly, if it becomes necessary. That is a flat percentage of tax applied to presently untaxed income. In other words, subtract your tax today from your present income and then apply a flat rate to the difference.

Corporate taxes have been raised three times plus an excess profits tax. Over 50% of total corporate profits are now paid out in taxes. Thus in spite of $13 billion left after taxes and dividends in 1950, corporations had to borrow $9½ billion for buildings and equipment to stay in business.

NAM can't do it, but all of us working together can show that a corporation can't be beaten or kicked without anyone being hurt. You and I know it, but the people of the country don't know it. We must sell them the idea that what hurts corporations is going to hurt many people.

A fair way to tax corporations is to leave the corporate rate at 38% as it was early in June 1950. Then to add taxes for defense purposes impose an additional tax which would be a flat percentage applied to the liability figured under the 38% rate.

Thus if a corporation's tax at 38% was $100,000 a defense tax would be applied to this figure. If, for example, the defense tax was 45%, then the total tax would be $145,000 (normal tax $100,000, defense tax $45,000). We could raise approximately $6¼ billion a year through such a tax.

Today corporations are paying over 50% of their profits in Federal taxes in a period of defense and partial mobilization. If, during the years 1940 through 1945, we had applied a flat rate of 48.4% to corporate taxes we would have received more income at Federal level than we actually did through a combination of corporate tax and the excess profits tax during those years.

In summary, the NAM program is: 1. Cut spending. 2. Sound debt management. 3. A sound tax policy.

The result of such a program would be no inflation. Can we do it? If the people are aroused we can. This has been proved in connection with the shelving of the Spence Bill; repeal of the Wagner Act; and, retention of the Taft-Hartley Law.

NAM sometimes is considered the kiss of death, but recently two of its officers were elected to Congress. So things can be done. The American Farm Bureau Federation asked for a halt to subsidies to farmers; a group of cooperatives asked that these organizations be taxed on a par with corporations.

You can spread the word. You must do it if you are to exist in a free economy.

Prepare Now for Renegotiation

By KENNETH G. SMITH, *Consultant*
Philadelphia, Pa.

The Renegotiation Board as set up under the Act has the authority, after weighing all the facts and data presented by the contractor, to reclaim any profit considered to be excessive.

The first important question for a contractor to ask himself is: "Am I subject to renegotiation and how do I go about finding out?"

He must bear in mind that the responsibility for determining if his sales are subject to renegotiation has been placed upon him by the various renegotiation acts.

The contracting officer should insert in every prime contract a clause stating that this contract is subject to renegotiation. However, the absence of such a clause or the lack of notification on purchase orders or subcontracts does not preclude the application of the act.

It may be that several months will pass before your company as a prime contractor or subcontractor has a sufficient volume of business to bring it within the scope of the Act. Do not, however, postpone the adoption of the common sense measures which should be installed in your company. Get started now to "be prepared" for renegotiation. In other words, here is the law. How much work does it entail to comply with the regulations and what is the most intelligent way to handle the problem?

Prime contractors and even many subcontractors have been rendering valuable assistance to their suppliers as to the end use of a product. To secure the best results from them a segregation of sales should be made now for 1951-52 and kept up to date. Prime contractors who suddenly receive countless requests at the last moment just cannot give each request for facts about end use the attention it deserves. Remember the *end use* of the product determines its inclusion in renegotiable business. In other words do Government funds pay the bill directly or indirectly and did the sale or work to be performed result from a directive having a National Defense end use.

The method used must be fair both to the Government and the contractor and be consistent with good accounting principles.

Methods Used To Segregate Sales

The methods most commonly used and which have been approved in the past include the following:

1. Actual method is where prime contracts, subcontracts, purchase orders, etc., can be clearly identified as National Defense business. Frequently a contractor uses this method in conjunction with one of the other methods.

2. An allocation method based on industry, customer or consumer group use of the product. An analysis on the production of certain items in a particular industry group which will indicate that the use is clearly National Defense end use is a reasonable approach to the segregation problem. The results must meet with the approval of the Board as being a practicable fair method to use.

3. Product or product group classification which clearly indicates the potential end use of the article. Allocation of materials, granting of certificates of necessity or normal general use of the item often clearly labels it as a national defense sale.

4. Where a division, department or plant of a company is devoted to National Defense work. Some companies have found it to be advantageous to set aside an entire plant or organize a special department to handle those sales considered to be subject to renegotiation.

5. An allocation method based on Government, trade association, or other reports whereby the end-use of the product may be determined. The basis for using this method should be cleared with the Board before it is put into operation.

6. Spot checks of detailed transactions for part of the fiscal year and applying the percentage to the total sales for the year. This method is often used by companies having thousands of small sales each month.

Sales Subject To Renegotiation

Contracts with the following Governmental agencies are subject to renegotiation unless specifically exempt under the act.

1. Department of Defense
   a. Army
   b. Navy
   c. Air Force
2. Department of Commerce
3. The General Service Administration
4. The Atomic Energy Administration
5. The Reconstruction Finance Corp.
6. The Panama Canal Co.
7. The Canal Zone Government
8. Housing and Home Finance Agency

The President, in Executive Order 10260, has exercised the authority granted him by Section 103(a) of the Renegotiation Act of 1951 to designate the following additional agencies whose contracts on or after July 1, 1951 will be subject to renegotiation.

1. The Federal Civil Defense Administration
2. The National Advisory Committee for Aeronautics
3. Tennessee Valley Authority
4. United States Coast Guard

The President has the authority to include other agencies of the Government when he deems that they are exercising functions considered to be under National Defense.

Who Is Subject To Renegotiation

The 1951 act provides that all amounts received or accrued by a contractor on and after January 1, 1951 attributable to performance after June 30, 1950, are subject to renegotiation if they aggregate more than $250,000 in the fiscal year.

Contract brokers whose income is derived from fees or commissions based on contracts or subcontracts for any year in which receipts or accruals are more than $25,000 are also subject to renegotiation.

Contractors subject to renegotiation:

1. Prime Contractors
2. Subcontractors
3. General suppliers
4. Commission Brokers

Fiscal Period and Statute of Limitations

Those companies who had Government business subject to renegotiation with fiscal periods ending up to and including December 31, 1950 are subject to the Renegotiation Act of 1948.

Those companies who have a December 31st fiscal for the years 1951, 52 and 53 are subject to the Renegotiation Act of 1951.

Those companies who have a fiscal period other than December 31st during 1951 are subject to both the 1948 and 1951 Acts. They can, however, elect to have one renegotiation proceeding under the 1951 Act.

The amount subject to renegotiation say for a June 30, 1951 fiscal year is calculated as follows:

6/12 or ½ of $100,000—1948 minimum or	$ 50,000
6/12 or ½ of $250,000—1951 minimum or	125,000
Total	$175,000

If the contractor's sales having a National Defense end use totals $175,000 or more he is subject to renegotiation.

The 1951 Act clearly states the statute of limitations, for both the 1951 and 1948 Acts. Briefly the statute of limitations does not start until the contractor files his mandatory statements. Ten years can pass and in a final check up the Government can locate a company who has not filed and start renegotiation proceedings.

Once the contractor has placed on file his statements the Government must start proceedings within a period of one year and render a decision within two years.

Factors In Determining Excessive Profits

Each individual contractor is judged on the basis of the merits of his own particular case. There is no industry base, formula or standard by which a company is measured. The Board recognizes that the factors for one company will not apply to the next one that may appear before them. Renegotiation proceedings must be tailored to fit the company under consideration.

To prepare a good brief for your company you must be able to stand off from the contractor and constructively view all the factors and prepare an analysis of the company which will permit the Board to make a competent determination: fair both to the Government and the contractor. The current Military Renegotiation Regulations read as follows:

"In general, reasonable profits should be determined by over-all evaluation of the particular factors present without limitation or restriction by any fixed formula with respect to rate of profit, or otherwise. Renegotiation proceedings should not result in a profit based on the principle of a percentage of cost. Contractors who sell at lower prices and produce at lower costs through good management, improved methods of production, close control of expenditures, and careful purchasing will receive a more favorable determination than those who do not. Such favorable or unfavorable determination will be reflected in the profits allowed to be retained by the contractor or subcontractor as non-excessive. Claims of a contractor for favorable consideration *must be supported by established facts, analyses, and appropriate comparisons.*"

The factors to which the Board gives consideration in determining the excessive profits of contractors are:

1. Efficiency of the contractor with particular regard to attainment of quantity and quality production, reduction of costs, and economy in the use of materials, facilities and manpower.

2. Reasonableness of costs and profits, with particular regard to volume of production, normal earnings, and comparison of war and peacetime products.

3. Reasonableness of return on net worth with particular regard to the amount and source of public and private capital employed.

4. *Extent of risk assumed, including the risk incident to reasonable pricing policies.* (Very important to heat treaters—Ed.)

5. Nature and extent of contribution to the defense effort, including inventive and development contribution and cooperation with the Government and other contractors in supplying technical assistance.

6. Character of business, including source and nature of materials, complexity of manufacturing techniques, character and extent of subcontracting and rates of turn-over.

7. Such other factors as the consideration of the public interest and fair and equitable dealings may require, which factors shall be published in the regulations of the Board from time to time as adopted.

The final determination as to the profit which the contractor is permitted to retain will be based upon the data submitted by him on the above factors.

Protective Renegotiation Measures

Now is the time for a contractor to consider the protective measures which he should take to insure a more intelligent determination by the Board. It is evident that the contractor, through his own disclosures concerning his business, places in the hands of the Board the tools which they can use in measuring his National Defense efforts. A busy executive, harassed with many production, procurement and financial problems, should not write the renegotiation brief for his company. He is too close to the work and will rarely do full justice to the report.

A company exists only if it makes profits. The life blood of a company can be drained away through lack of intelligent consideration or attention in preparing an adequate report. The profit of a company is not the work of one man. It represents the efforts of every employee of the organization. Never lose sight of the fact that the Government can eliminate that portion of the profits deemed to be excessive.

The renegotiation brief is perhaps the most important report a contractor will prepare during the year. It should not represent an added duty to a busy comp-

(Continued on page 20)

What Platers Can Do About the Nickel Shortage*

Variety of plating and coating techniques available where restrictions on nickel for plating make conventional copper-nickel-chrome finishes impossible

EDITOR'S NOTE: *Electroplating operations are frequently a function of both the commercial heat treating plant and the industrial heat treating department. The following short article provides some very fundamental information which should help the electroplater solve a currently serious problem.*

Restrictions on nickel for plating, imposed by order M-14 and amendments, issued by NPA, have caused a flurry of activity in the past few months to find methods and materials which would permit continuing manufacture of bright-plated parts, conventionally carrying the copper-nickel-chrome type of plating. Particularly in the automotive and auto parts industries which account for a large volume of chrome plating has this search been pushed at fever pitch, in view of the NPA ban on nickel plating in a long list of specific decorative items. This took effect on Mar. 1, although it was relaxed at the last minute to permit use of nickel anode stocks in the hands of platers. This respite, while most welcome, does not solve the problem for sooner or later the supply of nickel for plating nonessential items will be exhausted. And at the same time sharp cuts have been made in permissible nickel use on parts where it is considered functional.

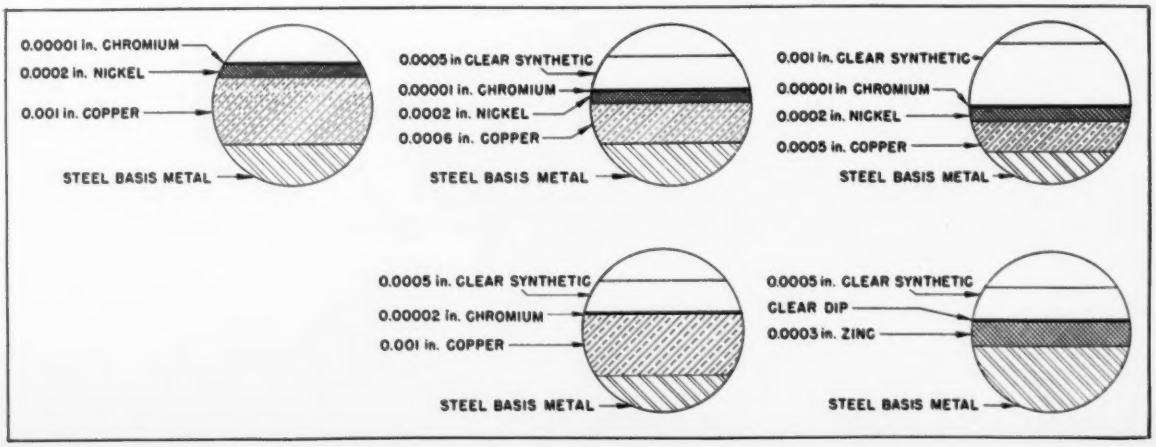
So the rush for alternate finishing treatments is on. One of the most obvious changes is to chrome plate directly on straight-chromium stainless steel. This has been done widely in recent years by the automobile industry, but solely for the purpose of color matching stainless steel moldings and trim with other chrome-plated parts, such as bumpers, hardware and the like. The chrome in this case is just a flash over the stainless. The treatment is not universal through the auto industry. Packard for example, being content to leave its various stainless steel moldings unplated, feeling that few people will notice the slightly yellowish tinge to the highly-buffed parts, and that the cost savings outweigh any possible objections.

According to engineers of United Chromium Inc., Detroit and New York, 18-8 chrome-nickel stainless steel has slightly better corrosion resistance than the straight-chromium grade, but the two become practically equal when a flash chrome is given the latter type. One difficulty has been that in plating chromium on stainless steel from ordinary solutions it came out milky, requiring a finish buff. Use of UCC's self-regulating high-speed chromium solution is claimed to overcome this tendency toward milkiness.

A number of other suggestions have been advanced to alleviate or circumvent the tightening situation in nickel for plating. Five are summarized as follows, with sketches shown below high-spotting the procedures in magnified form:

Less Nickel, More Copper—Some engineers, believing that copper and nickel have about equal value in protecting steel against corrosion, specify combined thickness of copper and nickel instead of individual thicknesses. One specification for chrome-plated steel parts in outdoor service calls for 0.00065-inch copper, 0.0006-inch nickel and 0.00001-inch chromium. This is known as an FS plate, good for 72 hours of continuous exposure in salt spray. Reliable corrosion tests can be cited to show nickel provides greater protection than copper, and some plating specialists maintain that anything less than 0.001-inch of nickel

*Reprinted courtesy "Steel"



means poor corrosion protection. In the present emergency, of course, there is the tendency to gloss over the importance of nickel and simply plate on more copper, as in the first example where copper replaces two-thirds of the nickel called for in the previous specification. One problem, where a high volume of plating work must be handled, is the changing of solution tanks, power circuits, conveyor equipment and time cycles which obviously will be completely different in view of the much thicker copper plate required.

Less Nickel + Clear Synthetic—Another method of compensating for less nickel is to leave the copper base plate unchanged at 0.0006-inch, cut nickel to one-third of the normal spec, and apply a surface coating of 0.0005-inch clear synthetic lacquer as diagrammed in the second sketch. Air-drying nitrocellulose-acrylic lacquers are being used successfully in this instance, although urea-formaldehyde clear baked synthetics give longer wear and better corrosion resistance. Low-priced articles of brass have been plated with nickel only 0.0001-inch thick, and a satisfactory product for indoor use can be given as little as 0.00005-inch nickel, coated with a clear lacquer.

Less Nickel, More Synthetic—On parts such as refrigerator shelves which must withstand high humidity, clear synthetics have been used regularly over copper-nickel-chromium plate to furnish added protection. Cutting back nickel to, say, 0.0002-inch may be compensated for by doubling the thickness of synthetic, to 0.001-inch, as indicated in the third example. Baking synthetic of the urea-formaldehyde composition is recommended in this case.

Copper, Chromium and Synthetic—In certain applications, such as those where no exposure to weather or humidity conditions is involved, nickel can be eliminated altogether and the steel plated with a heavy layer of copper, perhaps 0.001-inch, plus a 0.00002-inch flash of chromium. It is usually necessary to buff the copper pretty thoroughly in order to get a smooth surface for the chromium which is so thin that any irregularities in the copper will show through. Depending upon the service involved, the copper-chromium plate may or may not be given a coat of clear lacquer; the fourth example sketched calls for half a thousandth of synthetic.

Zinc + Brightener + Synthetic—One of the most attractive alternate plating methods automotive plating technicians have come across is depicted in the fifth sketch and involves electroplating of 0.0002-0.0005-inch of zinc direcly on steel, followed by a dip in a special chromate-type solution which both brightens and increases corrosion resistance of the zinc deposit. Following the brightening and passivating treatment, a clear baking synthetic is applied and, in the opinion of many, the result is difficult to distinguish from chrome plate.

A switch to this type of finish, contingent upon a supply of electrolytic zinc of course, permits continued production of bright plated parts with a 50-70 per cent saving in plated metal over the conventional 0.001-inch of copper and nickel. A leading bicycle manufacturer has replaced nickel plate with the combination of zinc plate and chromate brightener, discovering that the alternate finish not only has improved corrosion resistance but greater sales appeal because of its chromium-like appearance.

Stopoff lacquers used to prevent metal from plating where it is not wanted or needed usually are removed after plating. Now metal finishers are developing a method of using stopoff lacquer on the reverse sides or backs of parts to save nickel, and then leaving on the lacquer as a rust-resistant final finish. An example is the automobile radiator grille of stamped steel on which a lustrous finish is required only on the outer surface. Stopoff lacquer on the concealed surfaces reduces the amount of plating metal needed.

The nickel shortage has provided the opportunity to promote finishes other than the widely used chrome plate, particularly color finishes. Copper plating of steel parts, with a protective lacquer coating might be one example. One of the newer refrigerator models has interior trim finished in copper plate and clear lacquer. Another manufacturer is developing a line of steel kitchen utensils, copper plated and finished in a wear-resistant baking synthetic.

Still another finishing procedure which some of the tubular furniture manufacturers have O.K.'d comprises a deposit of 0.0001-0.0002-inch of chromium directly on the steel, plus a baked clear synthetic. In certain other applications clear and tinted synthetic coatings applied directly to steel and zinc-base die castings are getting serious consideration.

Success of the direct chromium application is dependent on a good baking synthetic lacquer to seal cracks in the chromium plate. United Chromium reports the use of its B-159 synthetic on chromium-plated steel panels has withstood 500 hours in 100 per cent humidity at 100°F, and also has withstood 500 hours in a standard salt spray without signs of failure.

Outlook Is Bleak—As long as nickel continues to be stockpiled at a furious pace and as long as the military continues to talk in terms of 18,000-20,000 jet engines a month there is not going to be enough metal for platers. Aircraft engine research is being directed toward reducing the amount of critical metals in blades, disks and casings of jet engines, but there is no great pressure on this work since in time of emergency aircraft engine builders can have pretty much whatever they want as far as alloys are concerned. At the same time, there are no indications of any letup

(*Continued on page 16*)

News to Heat Treaters...

"Heat Treater" Now A Critical Occupation

Probably the most important news to heat treaters that has developed in recent months was the placing by the Department of Labor of the occupation of "Heat Treater" on the lost of critical occupations.

Many months ago the Metal Treating Institute petitioned the Department of Labor for this classification and worked constantly toward its achievement. The Department of Labor's definition of the occupation will be found on Page 14.

* * * *

New Metal Treating Process Being Developed

The formation of a new metal treating and electroplating company, Allied Metal Treating Corp., which ultimately may represent a $2,500,000 investment, was announced by Charles I. Wesley, Milwaukee industrialist.

Mr. Wesley is board chairman of the new firm, and Evan C. Schwemer, a Milwaukee attorney, is president. The firm has an initial capitalization of $500,000.

Mr. Wesley said that the company has acquired a 110-acre tract near Kenosha, Wis., on which it proposes to build a factory and an administration building. Plans call for a factory building about four blocks long. Construction is not expected to start before 1952.

In present buildings on the property, the company has about 10 employees working on a "pilot-type operation" of a new metal treating process. It may eventually employ several hundred persons, he said.

Mr. Wesley, who is president of Wesley Steel Treating Co. of Milwaukee and has spent 36 years in the metal treating field, will continue to head his own firm. The new company has no connection with his firm.

* * * *

To Develop New Chemicals From Natural Gas

Dr. Thomas R. Steadman has joined the Petrochemicals Research Department of National Research Corporation, Cambridge, Massachusetts.

From 1941 until 1951 Dr. Steadman was employed as an organic chemist by B. F. Goodrich, Brecksville, Ohio.

In his new position Dr. Steadman will be supervising the organic chemistry phases of the research program undertaken jointly by National Research Corporation, Electric Bond and Share Company, and United Gas Corporation directed toward the development of new chemicals from natural gas.

New Factory For Dow

In line with its new expansion program to meet industry's increased demand for the Dow Batch-Type Controlled Furnace, the Dow Furnace Company has purchased and is occupying a just completed factory and office building at 12045 Woodbine Ave., Detroit, according to Martin J. Neumeyer, vice president.

* * * *

Special Session on Hardening High Speed Tool Steel

Park Chemical Company, in cooperation with Commercial Steel Treating Corporation of Detroit, were hosts at a special forum of 125 of the country's leading metallurgists on Thursday morning, October 18th.

Attending the current National Metals Congress here, the group gathered at this special session to discuss methods of hardening high speed steel in salt baths. Chairman of the meeting was Robert Lynch of Park Chemical. Technical papers were presented by seven men who are chief metallurgists of their respective companies. They were:

James Morrison—Landis Machine & Tool Co., Pennsylvania
Ural Gillett—Barber-Colman Co., Illinois
W. E. Bancroft—Pratt & Whitney Division, Connecticut
Stuart Sinclair—Greenfield Tap & Die Co., Massachusetts
Walter Peterson—Gorham Tool Co., Michigan
W. R. Frazer—Union Twist Drill Co., Massachusetts
Robert Adair—Gleason Works, New York

* * * *

New Building For Lepel

Lepel High Frequency Laboratories, Inc., manufacturers of induction hardening equipment have moved into a complete new building containing factory and offices in Woodside, New York City. The new home is just twenty minutes from Times Square. The address is 55th Street and 37th Avenue, Woodside 77, New York City.

New Wheelco Western Division Office

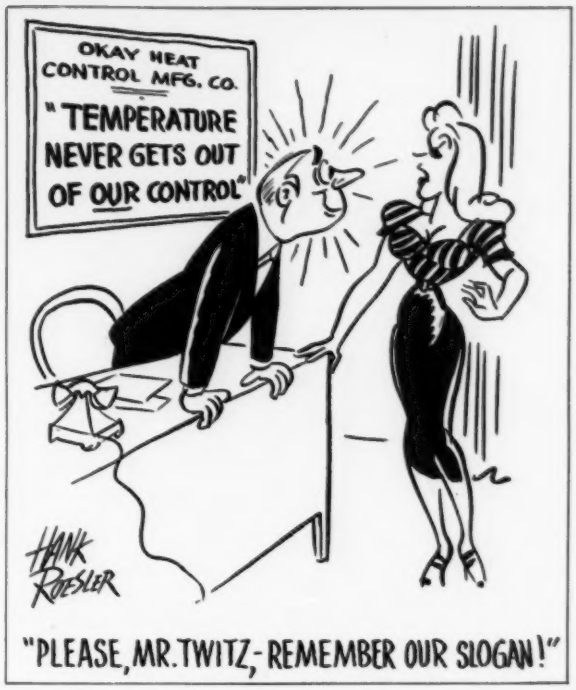
The Western Division Sales Office of the Wheelco Instruments Company, manufacturers of industrial measuring, controlling and recording instruments, has been moved to larger more convenient offices at 2320 Milwaukee Avenue, Chicago.

This office, under the direction of R. A. Schoenfeld, Vice President and Western Division Manager, will serve as a sales headquarters for Wheeelco representatives and agents covering the territory from Detroit to the West Coast.

In addition to being a clearing house for Wheelco branch office sales activities, the new office will also provide complete sales and service facilities for Chicago and fringe areas of Illinois, Indiana and Iowa. The telephone number remains unchanged.

Company activities other than sales and service will be continued at the Wheelco plant located at Harrison and Peoria Streets, Chicago.

The definition of a communist is a failure who envies your success and wants to tear you down to his level so he will not need to envy you.



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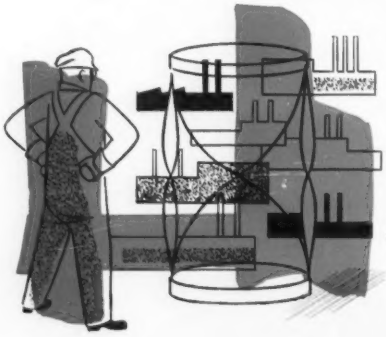
When you require the ***BEST*** *in Heat Treatment of Metals add an* MTI *Commercial Heat Treating Plant to your facilities*

Today's industrial production picture is placing increasing emphasis upon all forms of heat treating. This is true in military manufacturing where high specifications must be met and in civilian output where commercial and substitute metals must be used. Demand for heat treating services has more than doubled in a single year—a demand which is being met in the plants of the members of the Metal Treating Institute, the leading commercial heat treaters in the United States.

There are *3* basic reasons why, when you require heat treating service, you should consult an MTI commercial plant first:

1. ***He offers under one roof complete service for all basic types of heat treating processes.***



2. ***His skills and equipment have been developed over years of meeting industry's needs.***

3. ***As an MTI member he is a leader in the field—known for quality—service—technical ability.***

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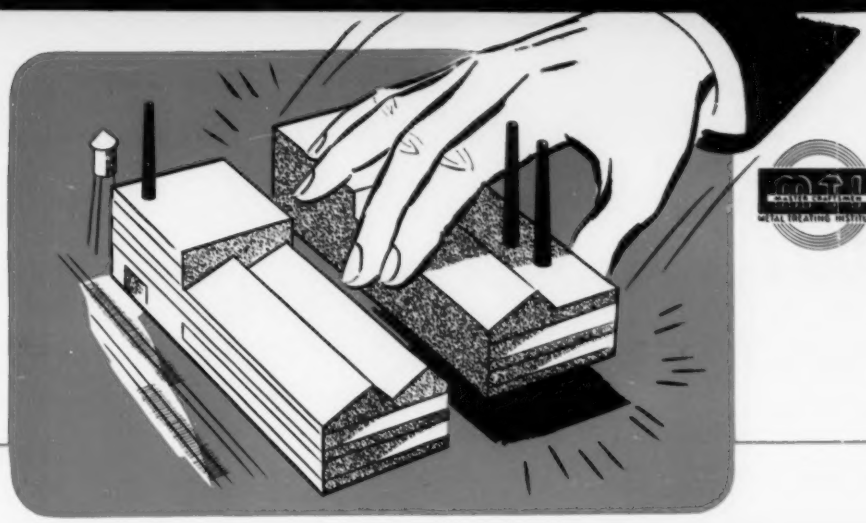

For the BEST in Heat Treating Consult these Companies:

CALIFORNIA

California-Doran Heat Treating Co.
2850 E. Washington Blvd., Los Angeles 23
Cook Heat Treating Corp.
5934 Alcoa Ave., Los Angeles 11
Lindberg Steel Treating Co.
3537 East 16th St., Los Angeles 23
Industrial Steel Treating Co.
600 Fallon St., Oakland 7
Dexter Metal Treating Co.
1026—77th Ave., Oakland 21

COLORADO

Metal Treating & Research Co.
651 Sherman St., Denver 3

CONNECTICUT

Commercial Metal Treating, Inc.
89 Island Brook Ave., Bridgeport 6
Stanley P. Rockwell Co.
296 Homestead Ave., Hartford 5

ILLINOIS

Accurate Steel Treating Co.
2226 W. Hubbard St., Chicago 12
Chicago Steel Treating Co.
333 North California, Chicago
Dura-Hard Steel Treating Co.
2333 West Deming Place, Chicago 47
Lindberg Steel Treating Co.
222 North Laflin St., Chicago 7
Pearson Industrial Steel Treating
5757 Ogden Ave., Chicago 50
Perfection Tool & Metal Heat Treating Co.
1740 West Hubbard St., Chicago 22
Fred A. Snow Co.
1942 West Kenzie St., Chicago 22
American Steel Treating Co.
P. O. Box A, Crystal Lake
Eklund Metal Treating, Inc.
721 Beacon St., Love Park
O. T. Muehlemeyer Heat Treating Co.
1531 Preston St., Rockford
C. U. Scott & Son, Inc.
1510 First Ave., Rock Island

INDIANA

Nerl Heat Treat Corp.
1824 So. Franklin St., South Bend 23

MARYLAND

Maryland Tool Company
111-13 Hollingsworth St., Baltimore 2

MASSACHUSETTS

New England Metallurgical Corp.
9 Alger St., South Boston 27
Porter Forge & Furnace, Inc.
74 Foley St., Somerville 43
Greenman Steel Treating Co.
284 Grove St., Worcester 5

MICHIGAN

Anderson Steel Treating Co.
1337 Maple St., Detroit 7
Commercial Steel Treating Corp.
6100 Tireman Ave., Detroit 4
Commonwealth Industries, Inc.
5922 Commonwealth Ave., Detroit 8
Vincent Steel Process Co.
2424 Bellevue Ave., Detroit.

MINNESOTA

Metallurgical Control Labs.
2226 East Lake St., Minneapolis 7

MISSOURI

Lindberg Steel Treating Co.
650 East Taylor Ave., St. Louis 15
Paulo Products Co.
5711 West Park Ave., St. Louis 10

NEW JERSEY

Ace Heat Treating Co.
611 Grove St., Elizabeth
American Metal Treatment Co.
Highway 25 and LaFayette St., Elizabeth
Benedict-Miller, Inc.
Marin Ave. and Orient Way, Lyndhurst
Bennett Steel Treating Co.
246 Raymond Boulevard, Newark 5
L-R Heat Treating Co.
107 Vesey St., Newark

NEW YORK

Fred Heinzelman & Sons
138 Spring St., New York 12
Alfred Heller Heat Treating Co.
391 Pearl St., New York 7
Metro Heat Treat Corp.
466 Broome St., New York 13
Precision Heat Treating Co.
216 William St., New York 7
Lindberg Steel Treating Co.
620 Buffalo Road, Rochester 11
Syracuse Heat Treating Corp.
1223 Burnet Ave., Syracuse 3

OHIO

Cincinnati Steel Treating Co.
Wooster Pike & Mariemont Ave.,
Cincinnati 27
Queen City Steel Treating Co.
2980 Spring Grove Ave., Cincinnati 25
Lakeside Steel Improvement Co.
5418 Lakeside Ave., Cleveland 14
George H. Porter Steel Treating Co.
1265-71 East 55th St., Cleveland 14
Winton Heat Treating Co.
20003 West Lake Road, Cleveland 16
Ferrotherm Co.
1861 E. 65th St., Cleveland 3
Dayton Forge & Heat Treating Co.
2323 East First St., Dayton 3
Ohio Heat Treating Co.
1100 East Third St., Dayton 2

PENNSYLVANIA

Robert Wooler
Limekiln Pike, Dresher
J. W. Rex Co.
834 West Third St., Lansdale
Metlab Company
1000 East Mermaid Lane, Philadelphia 18
Wiedemann Machine Co.
4272 Wissahickson Ave., Philadelphia 32
Pittsburgh Commercial Heat Treating Co.
49th St. and A.V.R.R., Pittsburgh 1

TEXAS

Cook Heat Treating Co., of Texas
6233 Navigation Boulevard, Houston 11

WISCONSIN

Wesley Heat Treating Co.
825 South 21st St., Manitowoc
Hushek Metal Processing Co.
1536 West Pierce St., Milwaukee
Metal Treating, Inc.
720 South 16th St., Milwaukee 4
Thurner Heat Treating Co.
809 West National Ave., Milwaukee 4
Harris Metals Treating Co.
1745 Taylor Ave., Racine
Supreme Metal Treating Co.
4440 West Mitchell St., Milwaukee 14
Wesley Steel Treating Co.
1301-1403 West Pierce St., Milwaukee
Spindler Metal Processing Co.
2338 Mead St., Racine
Wesley Metal Treating Co.
2320 Mead St., Racine

Institute News . . .

ANNUAL MEETING

About 60 representatives of the commercial metal treating industry held their annual convention of the Metal Treating Institute in Detroit, October 12-14.

Executive Secretary of the Institute, C. E. Herington announced that a letter had been received from Maurice J. Tobin, Secretary of Labor, officially adding, as of October 8, "HEAT TREATER – ALL AROUND" as defined by the Department*, to the list of critical occupations. (See letter next page.)

This classification will do much to alleviate manpower shortages which had been developing within the industry, with resulting loss of production of parts vital to the re-armament program.

Members of the Metal Treating Institute are also planning a uniform Apprentice Program designed to attract young men to the industry. Apprenticeship standards are being established with the cooperation of The Bureau of Apprenticeship, of the Department of Labor.

At the General Business Meeting the following officers were elected:

President—J. Walter Rex, J. W. Rex Company, Lansdale, Pa.

Vice-President—George Harris, Harris Metals Treating Co., Racine, Wisconsin

Treasurer—Lloyd G. Field, Greenman Steel Treating Co., Worcester, Mass.

Board of Trustees—Robert Weir, Commonwealth Industries, Inc., Detroit, Michigan

Arthur Eklund, Eklund Metal Treating, Inc., Love Park, Illinois

Ray Sault, Porter Forge & Furnace, Inc., Somerville, Mass.

Purdy Benedict, Benedict-Miller, Inc., Lyndhurst, N. J.

Carl Muehlemeyer, O. T. Muehlemeyer Heat Treating Co., Rockford, Illinois

Clifford Cook, Cook Heat Treating Co. of Texas, Houston, Texas

The complete program is given below:

PROGRAM—METAL TREATING INSTITUTE
OCTOBER 12-14, 1951
Detroit-Leland Hotel—Detroit, Michigan

FRIDAY—October 12

Registration
President's Welcome and Minutes of Spring Meeting
Chas. Sligh—Natl. Assn. Mfrs.—"Taxation"
General Business Meeting—All Committee Reports
Plant Visitations
Meeting Board of Trustees—President's Suite

SATURDAY—October 13

Wm. J. Moore—Dept. of Labor—"Apprenticeship Program"
Clarence Burdick—Ford Motor Co.—"Quality Control at Ford"
C. G. Purnell—U. S. Steel Co. – "An Improved Quenching Method"
Motion Picture—"Induction Heat"
Banquet and Party

SUNDAY—October 14

General Business Meeting
Election of Officers and Installation
New Board and Executive Meeting

MID-WEST GROUP MEETS

The Mid-West Chapter of the Metal Treating Institute met on September 28th. The following companies were represented:

Accurate Steel Treating Co.
Chicago Steel Treating Co.
Harris Metals Treating Co.
Lindberg Steel Treating Co.
O. T. Muehlemeyer Heat Treating Co.
Pearson Industrial Steel Treating Co.
Perfection Tool & Metal Heat Treating Co.
Fred A. Snow Co.
Metal Treating, Inc.
Wesley Heat Treating Co.
Wesley Steel Treating Co.

The following officers were elected for the ensuing year:

President—Art Eklund, Eklund Metal Treating Co.
Vice-President—Treasurer—Kenneth Jenks, Lindberg Steel Treating Co.
Secretary—G. V. Harris, Harris Metals Treating Co.

NEW OFFICE FOR METAL TREATING INSTITUTE

The Metal Treating Institute announces the opening of its new office, Room 209, Pershing Square Building, New Rochelle, N. Y. The editorial operations of "Metal Treating" will also be centered there. Members, friends, authors, advertisers—all will find a sincere and hearty welcome at the new headquarters.

*The Department of Labor has set forth the following definition of "HEAT TREATER, ALL-AROUND."

Alters the physical properties of metal and alloy objects of a wide variety and of diverse shapes and sizes by controlled heating and cooling to produce specified degrees of hardness, strength, and toughness: Plans own work sequences and exercises considerable judgment in the application of heat treating methods and techniques where a high degree of control is necessary to obtain desired physical characteristics. Applies knowledge of practical metallurgy and of the characteristics of furnaces, chemical baths, mechanical and electrical control mechanisms, quenching mediums, and similar equipment in performing such operations as hardening, tempering, annealing, normalizing, carburizing or cementation, case hardening, cyaniding, and nitriding. Specifically excluded from this classification are those workers who follow specified heat-treating procedures and whose duties are usually limited to feeding identical units into a furnace and maintaining temperatures within prescribed limits and to objects of a limited variety.

The annual banquet of the Metal Treating Institute held in the Detroit-Leland Hotel, Detroit, October 13. During this happy occasion the limerick, to the right, was composed and is printed here, since it so aptly describes the group.

These are the members of MTI
Who are ever congenial and never say die
While they love to argue—listen and vote
When it comes to heat treating
They never miss the boat.

"HEAT TREATER"—A CRITICAL OCCUPATION

DEPARTMENT OF LABOR
Office of the Secretary
Washington, D. C.

October 8, 1951

Mr. C. E. Herington
Executive Secretary
Metal Treating Institute
271 North Avenue
New Rochelle, New York

Dear Mr. Herington:

Reference is made to the petition submitted by the Metal Treating Institute, requesting that Heat Treater be added to the list of critical occupations.

After evaluating all available information, the Interagency Advisory Committee recommended that HEAT TREATER, ALL AROUND, as defined in the enclosed job definition, be added to the list.

The Department, after giving relative weight to all factors involved, accepted the recommendation of the Committee, and has, as of this date, added HEAT TREATER, ALL AROUND, to the list of critical occupations.

Yours very truly,
Signed
Maurice J. Tobin
Secretary of Labor

Enclosure

MORE ABOUT "INSURED HEAT TREATING"

Our September-October issue carried a 2-page article on the insurance on insuring heat treating. The Committee is pleased to report that this proposition has taken definite shape, both as to coverage and rates, and is now available to any member of the Institute.

The coverage is very broad. Specifically, it insures against claims arising from errors and omissions and/or faulty workmanship in the handling or processing of metals in the course of the business of heat treating.

The basic policy carries a limit of $25,000 indemnity for any one contract lot or shipment. Each claim is subject to a $200.00 deductible clause so as to eliminate small nuisance claims and keep claims frequency down. The rate will be uniform as to all members, regardless of their gross income. The premium is based on gross income at a rate of 1%. As indicated in the article, we have secured the approval of underwriters to consider rate adjustment at the end of the year, dependent on the number of members who avail themselves of the coverage and the developed experience.

Policy may be written on an annual basis, based on the annual estimate, or quarterly, or monthly, depending upon the size of the plant.

Immediate binder coverage is available, upon receipt of agreed deposit premium, to any member.

For full particulars, get in touch with Metal Treating Institute, C. E. Herington, Exec. Secy., New Rochelle, N. Y.

Tempilstik®

the amazing Crayons that tell temperatures

A simple method of controlling working temperatures in:

- **WELDING**
- **FLAME-CUTTING**
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- **HEAT-TREATING IN GENERAL**

It's this simple: Select the Tempilstik® for the working temperature you want. Mark your workpiece with it. When the Tempilstik® mark melts, the specified temperature has been reached.

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gives up to 2000 readings

Available in these temperatures (°F)

113	263	400	950	1500
125	275	450	1000	1550
138	288	500	1050	1600
150	300	550	1100	1650
163	313	600	1150	1700
175	325	650	1200	1750
188	338	700	1250	1800
200	350	750	1300	1850
213	363	800	1350	1900
225	375	850	1400	1950
238	388	900	1450	2000

Also available in pellet or liquid form.

FREE —Tempil® "Basic Guide to Ferrous Metallurgy" — 16¼" by 21" plastic-laminated wall chart in color. Send for sample pellets, stating temperature of interest to you.

METAL & THERMIT CORPORATION

100 EAST 42nd STREET
NEW YORK 17, N. Y.

What Platers Can Do About the Nickel Shortage

(*Continued from page 9*)

in government stockpiling of nickel. Before Korea, the set-aside was supposed to be 1 million pounds a month, although actually this was allowed to drop to only a fraction of that amount. Starting last July, however, orders went out to resume stockpiling at the full amount and to make up deficiencies of past months. This put the finger on civilian nickel.

What has happened since then is cloaked under the convenient mantle of "military security." In any event, stockpiles are growing to mountainous proportions, even though the source of almost all nickel used in the U. S. is across a friendly Canadian border.

The Rights of Others

For democracy to survive, every person must realize that mere insistence on his rights alone will be of little avail, that a recognition of one's obligations is imperative—and that one of the most important obligations is that of respecting the rights of others.—*I. David Satlow*

Words to Remember:

• The name of the man or woman who first wrote the words may be long forgotten—but the words themselves are not. They are:

"I shall pass through this world but once. Any good thing, therefore, that I can do, or any kindness I can show to any human being, let me do it now. For I shall not pass this way again."

You cannot pound an idea into the human mind. An idea is a flower You can shake its perfume on the air, but that requires no bluster. An idea is a jewel. You can twirl it before the people, that the light of every facet may fall upon their eyes, but that requires no muscle. If you want to get a great truth into the human heart, tip it with a gentle tone.—*Charles E. Jefferson.*

We're beginning to suspect that it isn't wisdom that sobers us as we grow older; it's our inability to keep on making whoopee.

Always remembering, according to the *Stratford Beacon-Herald* that flattery is 90 per cent soap and soft soap is 90 per cent lye.

for information on materials-selection and materials processing

more than 19,000 technical men

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Materials & Methods

•

M&M brings technical men top editorial coverage of metal treating:

Ninety-eight articles on metal treating appeared in the editorial pages of MATERIALS & METHODS during 1950. In an average of eight or more articles every month M&M brings its readers highly-informative, *continuing* editorial coverage of the methods for changing or improving the properties of engineering materials.

•

Materials & Methods

The Magazine of Materials Engineering

A REINHOLD PUBLICATION

330 West 42nd Street
New York 36, New York

HOW CLAYTON MFG. CO. GETS CLEAN BRIGHT BLADES

by using AEROCARB® E&W Carburizing Compounds

Submerged to a point just above the shoulder, 3½" to 8" scissors and shear blades of SAE 1020 steel are carburized in an AEROCARB E&W bath at 1600°F, to a case depth of at least .020", depending upon the amount of finish grinding needed. Blades are oil quenched at about 125°F, hot water rinsed, and tempered for 20 minutes in a salt bath at 600°F.

In a second application, AEROCARB E&W acts as a heating medium for 3½" to 9" high carbon scissors and shears. These are heated to 1525°F, immediately oil quenched, hot water rinsed and then tempered in a salt bath at about 700°F.

Final Rockwell C hardness is between 52 and 55.

Advantages! AEROCARB E&W is a water soluble salt which can be removed quickly and completely by a brief warm water wash, leaving parts with a clean, bright finish. Also, this two-way use of AEROCARB E&W—as a carburizing bath and as a heating medium—simplifies Clayton's inventory.

Let Cyanamid technical service and heat treating compounds team up to help you meet rigid specifications required on defense and civilian contracts . . .

Next time, call Cyanamid first.

Cyanamid's heat treating compounds include:

AEROCARB® Carburizing Compounds
AEROCASE® Case Hardening Compounds
AEROHEAT® Heat Treating Compounds

JMT 11

AMERICAN Cyanamid COMPANY

INDUSTRIAL CHEMICALS DIVISION
30 Rockefeller Plaza, New York 20, New York

☐ Send technical data sheet on AEROCARB E&W.
☐ Have technical service representative call.

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District Offices: Boston • Philadelphia • Baltimore • Charlotte • Cleveland • Chicago
Kalamazoo • St. Louis • Los Angeles
In Canada: North American Cyanamid Limited, Toronto and Montreal

THERMO-COUPLETTES . . .

Gear Hardner Loads and Unloads *automatically*

A new high-production machine contour-hardens gears in six steps, Fig. 1. Able to handle gears ranging from 2½ to 8¼-in. pitch diam, it will harden any of the induction hardenable steels. The machine is made in only one size and with handloading its total processing cycle takes 45 sec. With the automatic loader, this time is 38 sec.

By the use of an automatic loading and unloading device, approximately six average-size single gears or three or four cluster gears can be accommodated in this machine. Gears placed in a dispensing magazine are transferred to a spindle which carries them to an inductor coil, where they remain during preheating, soaking, and a period of radio-frequency contour heating.

The spindle then transfers the gears to the quench position, delivering the treated gears to a receiving magazine. Limit switches initiate new cycles as long as gears remain in the dispensing magazine, and also prevent a new cycle from starting if the receiving magazine is full.

This machine is equipped for setup jogging, for hand-cycling the gear through its various operations, as well as for fully automatic operation.

Hardening Cycle Is Short

Fig. 2 shows the automatic operation of this equipment. In step 1, the spindle is in its upper position, and has picked up the bottom gear in the automatic loader. Next, the spindle rotates as it lowers the gear to the work coil. Here, a 10,000-cycle, audio-frequency preheating power is applied for approximately 15 to 20 sec. In operation 3, the gear remains in the work coil during a 10- to 15-sec. soaking period. The gear is then heated by 200,000-cycle radio-frequency energy for approximately 1 sec. in the same work coil.

After this cycle, the gear is moved rapidly to the quench position. Following the 8- or 10-sec. water-spray quench, it is raised and unloaded into the receiving magazine. The spindle then lowers about 3 in., the loader oscillates to the position shown in step 1. The spindle rises, picks up another unhardened gear and then is ready for the next cycle.

If through-hardening is desired, the soak and radio-frequency heating cycles are by-passed. If a submerged oil quench for through-hardening is desired, the work coil is raised and an oil pot installed in the sink.

In addition to contour and through-hardening, the machine can be used for other miscellaneous jobs, such as the hardening of integral spindle gears.

Abstracted from THE IRON AGE

Fig. 1—In 38 to 45 sec—depending on whether the automatic loader is used—this machine preheats, contour-hardens and quenches any induction-hardenable steel.

Designed for high production, it can also be used for thorough hardening.

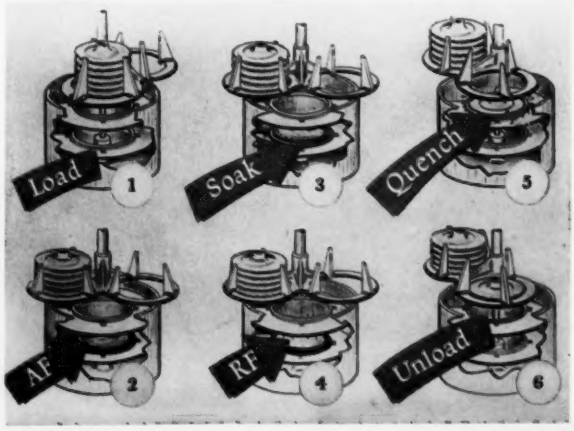
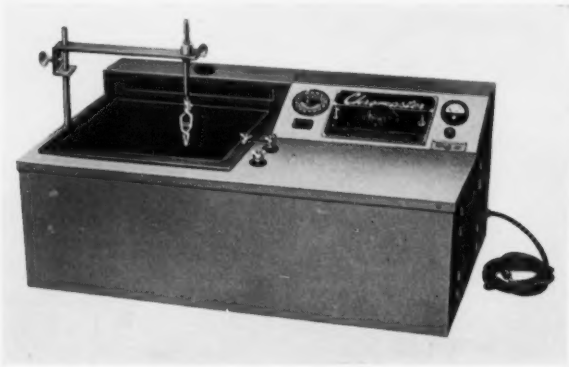


Fig. 2—This is the sequence of steps that the machine carries gears through in contour-hardening them.

Industrial Hard Chrome Plating Unit

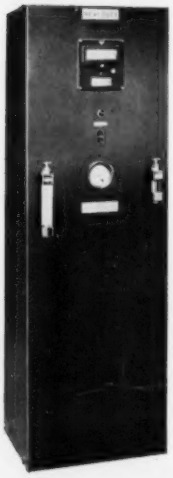
Model A-50 Chromaster is the latest addition to Ward Leonard's new line of Industrial Hard Chrome Plating Units. In combination with Chromasol solution, the Model A-50 Chromaster affords industry with a new production tool for precision industrial hard chrome plating directly on cutting tools and wear parts. Chromasol, a non-critical, economical plating solution developed for use in Chromaster plating units, operates at room temperature. The hard chrome deposit can be applied directly on industrial steels, cast iron and most non-ferrous metals.



This new bench mounted plating unit has a capacity for hard chrome plating metal surfaces totaling 25 sq. in. max. at the recommended current density of 2 amps. psi.

The equipment consists essentially of a built-in selenium rectifier power supply, rectangular plating tank and instrument panel. Cabinet measures only 14"H x 32"W x 19"D.

Atmosphere Generator Offers High Volume Capacity



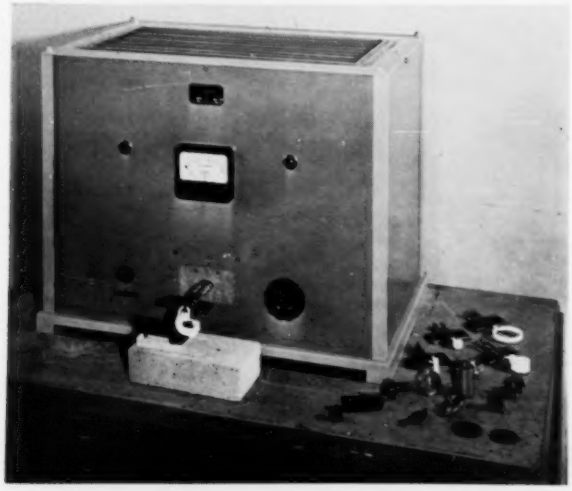
The "Atmo-Gen" Atmosphere Generator, manufactured by Hevi Duty Electric Co., Milwaukee 1, Wis., now offers twice the volume of atmosphere as units announced two years ago. It consists of an ammonia cracker which is housed in a fabricated steel cabinet. The complete unit includes an electric tube type furnace with automatic temperature control, catalyst filled alloy retort, necessary piping and flow regulation accessories.

The Hevi Duty Type M-5724-S "Atmo-Gen" Atmosphere Generators are used to provide atmospheres for the following heat treating operations: clean non-decarburized hardening, dry cyaniding or carbonitriding, carburizing (carrier gas), copper and silver brazing, nitriding, sintering and bright annealing. The unit delivers 150 cubic feet of atmosphere per hour.

Portable Induction Heating Unit

A portable high frequency induction heating unit is being offered by Lepel High Frequency Laboratories, New York 23, N. Y. The unit is designed for low initial cost and simplicity of operation, so as to make available the advantages of modern induction heating technique to a wider variety of heat treating plants and shops.

Contained in an all metal compartment the unit may be operated continuously under all load conditions, without the need of any special power installation.



In addition, Lepel is producing induction hardening equipment in both the tube and spark gap type from 1 to 100 KW output. The equipment is designed in accordance with customers' requirements and may include work and turn tables, progressive feed units, automatic fixtures, quench tables, etc.

Pitless, Controlled Atmosphere Furnace

The Dow Furnace Company of Detroit announces the recent development and successful operation of a small, pitless batch-type controlled atmosphere furnace for production gas cyaniding, gas carburizing, clean hardening and carbon restoration. Called the Model G, the small furnace is completely mechanized and self-contained. The objective of the design is to make it ideally suited

(Continued on page 21)

Prepare Now for Renegotiation

(Continued from page 7)

troller, treasurer or some other executive. It is more than accounting "know-how" and should be prepared by someone with the ability to interpret those factors that best represent the company.

There are many measures to adopt and install within your company. Put them into operation now. After the close of your fiscal period it is too late. Protective measures recommended for adoption at this time are:

1. A thorough analysis of sales, with careful attention directed to the advantages which can be secured from the application of special provisions in the Act such as, mandatory exemptions, partial mandatory exemptions for durable productive equipment, inventory cost allowance and permissive exemptions.

2. Thorough analysis of all items of cost in order to justify them in renegotiation proceedings. Maintain cost studies of National Defense work.

3. Preparation of adequate renegotiation files and the assembling of the data most beneficial to your company.

4. Formulation of a pricing policy for regular price reduction.

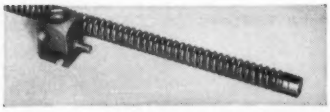
5. Analysis of the base period for cost trends as a guide for the current year. Presentation of facts on the position of your company within the industry.

Financial institutions before granting credit are now reviewing the contractors' statements in light of the effect renegotiation may have on profits before approving a loan. The information assembled for renegotiation proceedings will answer many of your banker's pertinent questions. If you cannot meet your banker's renegotiation test, how do you expect to meet the Renegotiation Board's test?

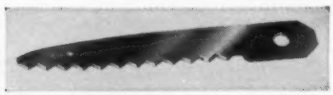
No Cleaning Problems with PARK-KASE 5-C

WATER SOLUBLE LIQUID CARBURIZER

Automotive door parts. Carburized up to 40 min. in PK-5C at 1500° F. oil-quenched. Case depths .008" to .012". All parts cadmium plated after casing in free-cleaning PK-5C.



Screw nut SAE 1118 oil quenched from PK-5C at 1550° F. 2 hours .020" case depth. Jack screw SAE 1027. In PK-5C for 20 min. roller quenched in oil. Pieces washed and plated.



Pinking shear blades .014" case in 1 hour at 1600° F. in PK-5C. Oil quench.

HEAT TREAT SUPERVISORS tell us that Park-Kase 5-C gives them absolutely trouble-free salt bath liquid carburizing; cuts time all around; requires no skilled help, yet assures accurate control.

EVEN THE MOST INTRICATE PARTS can be quickly cleaned from water-soluble Park-Kase 5-C, emerge with a gleaming, silvery finish, suitable for plating or not, as required.

FAST, REPRODUCIBLE CASES can be easily held to close limits for accurate, dependable work at temperatures up to 1750 degrees.

NON-HYGROSCOPIC PARK-KASE 5-C won't corrode metal pots, fixtures or finished work; won't precipitate sludge; won't foam during operation or while additions are being made. A carbon cover forms to protect men from excessive heat and fumes.

An extremely fluid bath, Park-Kase 5-C requires a light-weight original charge and maintains efficient carburizing activity by the replenishment of normal dragout. Park-Kase 5-E Energizer is added where conditions of unusually low replenishment are present.

SEND TODAY FOR:

NEW TECHNICAL BULLETIN

Completely describes use and operation of water soluble liquid carburizing baths.

Park CHEMICAL COMPANY
8074 MILITARY AVE.
DETROIT 4, MICH.

PERSONALS

'TWAS A SECRET

Joseph F. Hushek, Works Manager of Wesley enterprises and President of Hushek Metal Processing Company, Milwaukee, Wisconsin, took a bride on Saturday, September 8, 1951.

The employees of Wesley enterprises presented Joe and his bride with a Snooty Oldsmobile "88" Super Sedan, for their wedding gift.

After the presentation of the car, Joe and his new bride, the former Marie Kappel, disappeared in their new Oldsmobile to Chicago.

After spending their first night at the Hotel Bismarck they left the following noon on the Grand Canyon Special bound for the west, where they were honeymooning for one whole month.

* * * *

Robert F. Gunow, formerly with Commonwealth Industries, Inc., Detroit, is now functioning as Chief Plant Metallurgist for Kaiser Frazier Corp. at Willow Run, Mich.

Thermo-Couplettes (cont.)

for small commercial heat treaters and manufacturing firms.

In operation, the Model G will heat 500 pounds of work from room temperature to 1500° F., in one hour provided the furnace is stabilized at control temperature when the load is introduced. Net loads up to a maximum of 600 pounds of work can be processed although the net loads will naturally vary with the type of parts, temperatures and case depths.

Uniform, rapid heating of the furnace is accomplished by 4 radiant tubes fired with standard Dow Burners piped to necessary control valves, etc.

A gas generator system of catalytic type is incorporated within the radiant tubes to supply a gas neutral to medium carbon steels. An unusual feature of the tube and generator system is that the generator gas can be analyzed before going into the furnace. A high volume fan combined with a fan inlet assures a directed flow of atmosphere through the furnace load producing uniform heating and case depths. Quenching is done directly from the furnace vestibule. The oil in the quench tank is circulated in a manner similar to the atmosphere.

The furnace and the quench tank cover an area approximately 6 feet, 4 inches wide by 12 feet long with a required head room of 14 feet. The roller rail hearth is 2 feet x 2 feet and holds one tray 24 inches x 24 inches carrying a container with a maximum depth of 12 inches.

The citizen who keeps asking about federal spending, "Who's going to pay for all this?" can find the answer by looking in the mirror.

* * * *

One of the dumbest persons we have heard of recently is the man who held up a carload of tourists on their way home from Florida.

* * * *

Those Wall Street men who are going back to the farm ought to be efficient when it comes to watering the stock and shearing the sheep.

* * * *

Until they can live as they wish without working more than they wish, many people will see nothing but evil in the capitalistic system.

* * * *

"There are no important differences between man and woman," says a psychologist. Well now, what do you consider important?

FOR SALE: Late Model G. E. Box-Type Hardening and Cylindrical Draw Furnaces complete with Quench Tank;—Brown Recording Pyrometers. Used only 2 years. Excellent Condition.

T. M. CHAPMAN'S SONS CO. • 60 Center St., Old Town, Maine

JUST PRINTED!

NEW SLIDE CHART MAKES HEAT TREATING EASIER

Enables you to find at a glance this heat treating information on Carpenter Matched Tool and Die Steels:

- Forging heat
- Normalizing heat
- Annealing treatment
- Hardening treatment
- Drawing ranges
- Effect of drawing temperature on hardness

Gives new, valuable data on speed of heating with 2 vital rules for better results, tips on quenching in water, brine, oil and air, estimating oxidizing atmospheres, heating time, etc. A "must" to help every toolmaker and heat treater get better results, today. Return coupon now for free, easy-to-use slide chart.

THE CARPENTER STEEL COMPANY
198 W. Bern Street • Reading, Pa.
Please rush to me at no obligation, new Carpenter Guide to *Simplified* Tool Steel Heat Treating.

NAME..... TITLE.....
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CITY..... ZONE..... STATE.....
(PLEASE PRINT)

Write for NEW Price List on Solution Pots

YOU no longer need buy pots by the pound. Now, Fahralloy Solution Pots are unit priced. Get our prices on your requirements before placing your next order. Fahralloy Pots give maximum service life. Made of proved-in-service alloys, under close laboratory control. Patterns for practically all sizes of pots.

•

Cut costs with Fahralloy Pots, Carburizing Boxes, Trays, Fixtures, Furnace Rollers and other "heat-friendly" parts.

THE FAHRALLOY COMPANY

15500 S. Lexington Ave., Harvey, Ill.
Canadian Plant: Orillia, Ontario

LETTERS TO THE EDITOR

Dear Editor:

Having just spent five full lengthy days and nights in Detroit attending the annual exposition sponsored by the American Society for Metals, I thought you and perhaps your readers would be interested in one visitor's reactions.

Someone once described a motion picture as: "Gigantic! Colossal!! Stupendous!!! In fact, very mediocre." Perhaps these terms are not quite fitting to ASM's latest Barnum and Bailey production, but they said it was the largest (200,000 square feet), with an estimated attendance of 40,000 visitors, plus 20,000 local Detroiters. More than 400 exhibits kept God-knows how many loyal salesmen jumping up and down, wearily trying to be cordial good fellows to an average of more than 250 visitors per booth, bless 'em.

This brings up the horrid subject of the so-called food concession within the gates. Having visited many ASM Shows during our hectic life, we have learned one thing,—bring your lunch. We do not know by what mysterious process the management arranges for the victimization of its guests and exhibitors during meal hours, but certainly the arrangement in Detroit capped the climax, for low quality of food with a maximum of sloppy service and bad housekeeping.

The absence of the big metal companies with their former magnificent displays, has always been a loss. Their place has been taken by great numbers of smaller exhibitors, many in the accessory class having little or no direct connection with industrial metallurgy. Some of these are interesting and helpful if your strength holds out.

Once upon a time it was possible to find scores of new and interesting metallurgical developments at the Show. One remembers the advent of stainless steels, aluminum alloys, magnesium, nickel alloys, new steels, new instruments for pyrometry, metallography, testing, new types of furnaces.

One can hardly expect a banquet of new dishes each year, but it should not be so hard to find a kernel among the chaff. The serious searcher for new developments must plod up and down weary miles of endless aisles, goading his protesting dogs to carry him.

But the visitor has travelled an average of 500 railroad miles to reach this Show, and patiently endured the hardships of travel and the confusion and inconvenience of hotels whose service is demoralized by the presence of too many customers. Why not give the poor guy a break?

Two possibilities suggest themselves which the loyal member would receive with touching gratitude:

First. Arrange exhibits by kind. If a man wants to look at furnaces, let him see furnaces, without having to travel over labyrinthian acres to discover them. The American Gas Association has long held to this principle, but other furnaces are here, there, and anywhere.

Other groupings might include pyrometric instruments, physical testing machines, heat resisting alloys, shop accessories. To arrange the groups by kind would require some study, and might present a few complications and overlapping, but certainly it would cause the management no agony comparable with that of the visitor trying to bring himself up to date in a given field.

A noteworthy advance in this connection at Detroit, which is hereby acknowledged with deep appreciation, was the arrangement of metallographic equipment in Building B. None of the dire consequences predicted for segregation of exhibits was observable. Exhibitors said they had no embarrassment in being next to their competitors, and visitors confessed no shame upon leaving one booth to enter a similar one across the aisle. Let us have more of this at the next Show.

Second. Each year there are a few really interesting and novel developments in the metallurgical field, shown for the first time. It is suggested, for the benefit of dues-paying guests as well as paying exhibitors, that a neat but not gaudy sign be placed in such booths reading, "New This Year." Or, because all visitors cannot attend all Shows in the various cities, a subject might be new to many visitors in Detroit which was shown the first time in Chicago. Therefore, the sign might read, "New, 1950" or "1949," as the case might be.

Naturally, every exhibitor would like to take advantage of the claims of novelty in his booth. Therefore, a committee of ASM would have to check these items to verify their novelty and to insure against triviality.

Bill Eisenman has done a wonderful job in building up the ASM, not the least of which has been the annual Metal Show. Bill says he has given 33 annual reports, and hopes to give 33 more. That might bring him close to the century mark, and we hope he makes it. Bill has always had a young and fertile mind. We trust the first 33 years have not made him impervious to new ideas which could render the greatest technical society still more valuable and interesting to its appreciative membership.

The World Metallurgical Congress was a splendid enterprise and should be repeated. Our foreign guests were charming, intelligent, well qualified and eagerly interested in all they saw. Their conference sessions at Detroit might have been more gracefully handled, but we'll do better next time.

Looking forward to more of the same in Philadelphia next October.

Your Reporter and Member
ASM–MTI

Dear Editor:

I just finished reading the September-October issue of your "Metal Treating Journal." This is the first time I have seen the Journal and it certainly contains some very educational heat treating data; and also an advertisement of oil agitators that was of interest to us.

Would appreciate having my name put on your mailing list.

A. J. PEVERLEY, Supervisor
Heat Treat Department

The National Supply Co.
Torrance, Calif.

Dear Editor:

Thank you very much for your letter of September 18th, from which I am grateful to learn that you have placed us on your mailing list. I have great pleasure in reciprocating, and you should receive regular copies of this journal from now on.

I also greatly appreciate your permission to reproduce articles from "Metal Treating" and, of course, this is reciprocal.

It will always be a pleasure to keep you informed on any aspect of the work of metal treating in this country, and please command me at any time.

ALASTAIR McLEOD
Managing Editor

Metal Treatment and Drop Forging
London, England

Dear Editor:

Please accept our sincere thanks for receipt of your May-June issue containing the article "Heat Treatment of Plastic Molds."

We are sending this to our friends in Mexico for whom we obtained it and are sure they appreciate your kind cooperation.

A. D. CRISTIANO

F. H. Crawford & Company, Inc.
New York 7, N. Y.

Dear Editor:

With reference to your letter of October 26, we would appreciate receiving, without any obligation on our part, copies of your magazine, "Metal Treating" for the following persons in our organization:

H. M. Klein, Works Manager
J. S. Schneider, Chief Engineer
A. Schroeder, Tool Engineer
Al. Smith, Tool Superintendent
C. Parker, Chemist

GILBERT BUTLER
Pres. and Gen. Mgr.

The Bossert Company
Utica 1, New York

Dear Editor:

Mr. Fleischmann has asked me to reply to your letter of September 5th stating that you would not be able to attend the Emergency Conference on Iron and Steel Scrap. We appreciate your willingness to cooperate with us in our scrap programs.

Inasmuch as we are concerned with the treatment of all metals, I shall appreciate it greatly if you would send a copy of your magazine to Mr. Edward F. Mulligan of our Office of Public Information, assigned to the Salvage Program, who is located in Room 1069, Tempo T Building, Washington 25, D. C.

EDWARD W. GREB, Acting Director
Salvage Division

Department of Commerce
Washington 25

DEVINE AGITATORS

ASSURE

UNIFORM QUENCHING TEMPERATURES

- Provide proper circulation of quenching liquid.
- Help equalize quenching strains.
- Compact. Self-contained. No piping required.
- Unusually sturdy. Built for plenty of use.
- Easy to install. Easy to detach. Easy to maintain.

Devine Engineers will be glad to recommend a type and size to fit your tank.

J. P. DEVINE MFG. CO.

A. M. Cox, President

49th St. and AVRR · Pittsburgh 1, Pa.

Devine AGITATORS

Manufacturers' Literature . . .

The literature listed below contains information of interest to heat treating organizations. For your copy write direct to the manufacturer and be sure you mention seeing it reviewed in "Metal Treating."

Airless Blast Cleaning And Ordnance Production

How airless abrasive blasting can be aplied to solve the cleaning problems in industries concerned with ordnance material production is explained in a new bulletin, No. 794, recently published by American Wheelabrator & Equipment Corporation. Covering fields such as the cleaning of shells and bombs, tank parts, artillery components and aircraft engine parts, the illustrated brochure describes the use of airless blasting to various parts after heat treatment.

Also included in this bulletin is a demonstration of the various applications of shot peening in ordnance production. Machines are shown which are used in peening aircraft connecting rods, aircraft engine crankshafts, and torsion bars. Some interesting figures are included showing the increase in fatigue life gained from the shot peening operation.

Imported Hardness Tester

T. N. Holden Co., New York 7, N. Y., have a very complete four-page booklet describing the Galileo Hardness Tester. This testing unit, made in Italy, features immediate optical reading on Rockwell scales on a screen at high magnification. A complete list of various accessories is provided.

Oil-Gas Generator

Make your own gas with "VapOFier" is the title of an illustrated four-page booklet offered by Vapofier Corporation, Chicago 43. The "VapOFier" converts fuel oil to a combustible gas and has been used in various types of heat treating operations. The booklet provides a simplified drawing which clearly illustrates the operating principles of the unit.

Maintenance Guide for Electric Heat Treating Furnaces

Hevi Duty Electric Co., Milwaukee 1, have an excellent pocket size 16-page booklet providing highly practical information about the care and maintenance of electric heat treating furnaces. A useful maintenance check sheet indicating how frequently various items should be checked is included.

Ammonia Dissociators

Sargeant & Wilbur, Inc., Pawtucket, R. I., describe their Ammonia Dissociator with horizontal cracking chambers in a four-page folder. A schematic flow diagram provides a clear description of the Dissociating process employed.

Prepared Gas Atmospheres

A new illustrated bulletin, SC-155, on industrial applications of gas chemistry for heat treating has just been released by Surface Combustion Corporation, Toledo, Ohio.

Exothermic and endothermic type atmosphere generators are described and the gas generation processes schematically diagrammed. Compositions of each gas atmosphere and the respective heat treat process applications are described. In addition, notable examples of furnace design applications for continuous or batch production controlled atmosphere heat treating are presented.

The gas constituents, generator capacities, application data and operating costs for all of the prepared gas atmospheres are tabulated for handy reference in selecting atmospheres.

Cabinet Type Instrument Panels

A complete line of Cabinet Type Instrument Panels is listed and described in Bulletin P1-2, just released by Wheelco Instruments Company, Chicago 7, Illinois.

These new panels provide a simple and efficient method for conveniently mounting instruments and auxiliary equipment. A variety of standard cut-outs are available, and panels can be furnished as single units or combined to form one centralized control panel.

Junior Quencher

A newly improved quenching unit, designed to provide accurately controlled cooling during quenching operations on small parts and small quantities is described in a four-page booklet by Bell & Gossett Co., Morton Grove, Illinois.

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- **Generous Sized Cabinets**
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Yes . . . Lindberg Induction Heating Units are built for heavy production line service—far beyond the usual capabilities of induction heating equipment. Investigate the Lindberg Induction Heating Units. You will profit from their rugged ability to deliver 24 hour a day operation. Ask for Bulletin 1440.

Filament Voltage regulation assures maximum tube life—voltage regulators maintain filament voltage at proper values regardless of line voltage fluctuations—thus, tubes operate under ideal conditions.

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